GeoPointer X ®

User guide

Contents

GeoPointer X ®

GeoPointer X ® is an efficient way of linking geophysical survey data with specific geographic positions, comments and pictures. GeoPointer X retrieves the geographic position from any GPS device capable of outputting NMEA 0185; it then stores not only the longitude and latitude but also the coordinates according to the local grids.

Based on the distance information different events can be scheduled, for instance a picture can be taken or a trigger signal can be send to the appropriate device. All these events are linked in a database and are easily sorted and displayed for further use.

GeoPointer X ® has an inbuilt map utility, any map in digital or paper form can be easily loaded into the software. A minimum of information should be supplied for it to work and later on the map is always accessible as a part of a map library.

GeoPointer X ® can be of great benefit when collecting Ground Penetrating Radar data files. It will not only give an exact position of the survey location but also provide the professional with the ability of adding notes, pictures and coordinates to each particular location of the survey.

GeoPointer X ® has support for a wide range of sensors, such as temperature, humidity, atmospheric pressure and many others.

Overview
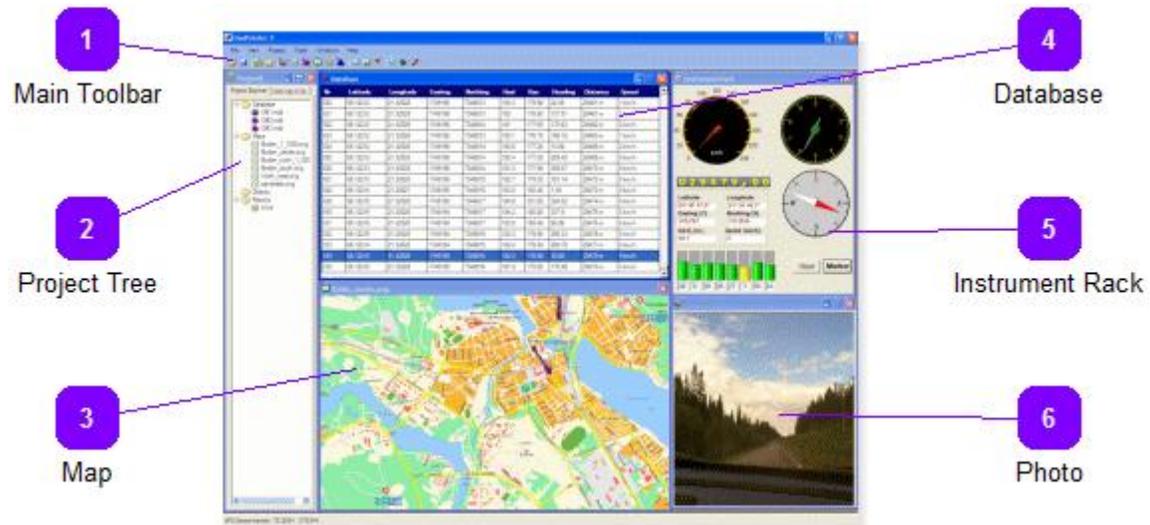
GeoPointer X counts with five independent windows that can be turned on or off depending on the users preferences. Each window has a specific function but the information presented by them is collected into the main database regardless of their status.

1 **Main Toolbar**

From the main toolbar all the major functions of GeoPointer X can be accessed.

2 **Project Tree**

The project tree window shows all the available databases, maps, objects and reports.

3 **Map**

The map window shows the current position on the selected map or the map corresponding to the loaded database in view mode.

4 **Database**

The database window contains and shows all the information that is being collected and stored while in collection mode, or it displays all the data in any of the stored databases in view mode.

Instrument Rack

The instrument rack window shows all the parameters obtained from the associated GPS unit, it also contains buttons for controlling external stimuli like the marker button.

Photo

The photo window shows the most recent taken picture when in collecting mode or the picture corresponding to the selected point in the map or the database.

Getting Started

GeoPointer X ® can work in two different modes: collecting and viewing. In the first mode the data is collected from all connected sources like GPS, camera and different sensors. In the second mode the collected database can be opened for further analysis.

In order to use maps in GeoPointer X ® it is necessary to add them to the application's map library. Read how to do that in the section õAdding Maps to the Map Libraryö.

COLLECTING MODE

Make sure the GPS unit is connected to the desired port and it is functioning properly. Open the application from the õstart menuö or by double clicking the application icon on the desktop.

For the first start-up do as follows:
Select from the main menu <tools> and from it <settings>, a new window called õGeneral Settingsö will open, alternatively you may use the F4 shortcut. In this new window select the settings for the connected GPS receiver and press the õTest GPSö function to be sure everything works fine. Select the proper geographic grid and datum, this is required for the X and Y coordinates to function properly. Finally, select directory where all the projects will be stored as default. Press OK so this settings become the default settings every time the application starts up. Please note that this settings can be modified at any time.

The first thing to do when starting a new project is to activate the GPS receiver by pressing the <connect GPS> button in the main tool bar. When the connection with the GPS has been established a message in the status bar appears informing us about the active port and the available amount of satellites. If for some reasons the link with the GPS receiver is lost a message appears saying õNo GPS receiver availableö, this takes approximately 30 seconds because GeoPointer X ® will try to restore the connection.

Now that the GPS is connected and everything working is time to create a new project. Select from the main menu <project> and from it <create new>, alternatively you can use the Ctrl+N shortcut. The project tree window opens. The local settings for the created project can be set by selecting from the main menu < project> and from it < project settings> or using the shortcut F3.

If the project is going to be using maps, then they have to be loaded from the map library. Read more about loading maps into a project in the õAdding maps to projectö section.

To start collecting data press the <run> button or Ctrl+R, to stop the collecting process press the <stop> button or Ctrl+Q.

VIEWING MODE

Select from the main menu <project> and from it <open>, the windows explorer opens showing the contents of the default directory specified in the general settings. Select the folder containing the required project and in this folder open the file with the extension GPX. The project opens with all the settings that were specified for it. Even if the stored project doesn't contain any maps it is possible afterwards to add maps to it in order to display the route of the points from the database.

Toolbar
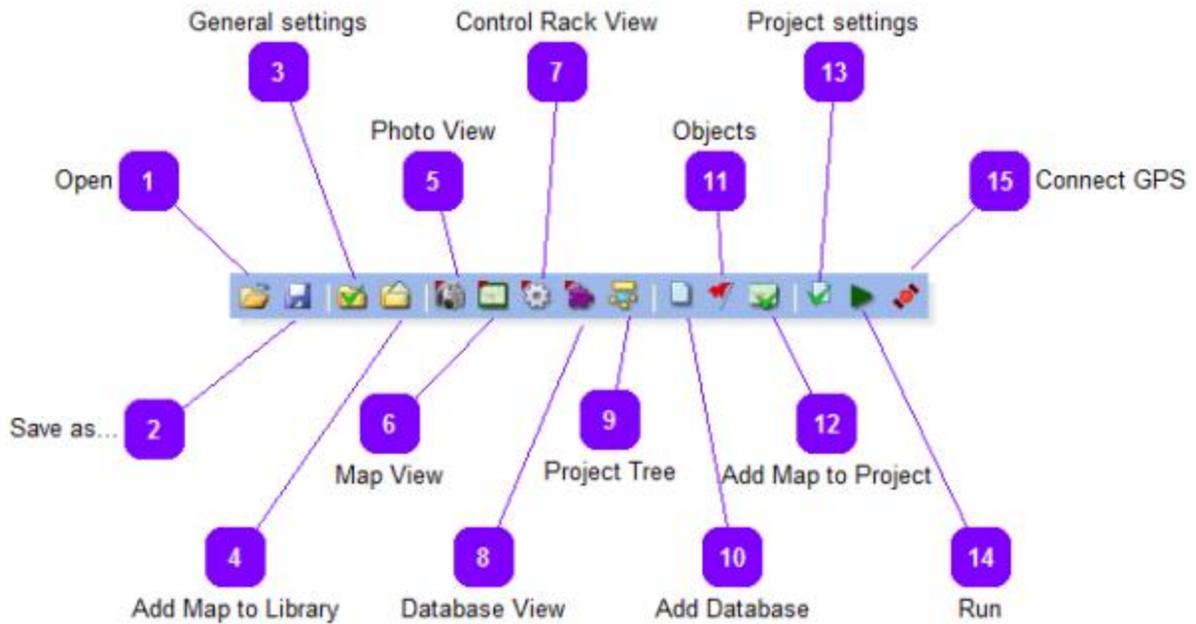
All the major functions in GeoPointer X are available via the main toolbar.

Open

Opens an existing project. It is possible to add data, maps or any other kind of information to the projects even post acquisition of the data.

Save as...

Saves the current project under a user's specified name. By default GeoPointer X assigns a project name such as Project1, Project2 ...etc.

General settings

Access control over the ports that will be used by the GPS unit, the grid and datum corresponding to the location of the project. It is possible to choose noise reduction for the project and the destination directory as well.

Add Map to Library

Opens a new window for adding maps to the GeoPointer X map library.

Photo View

Opens or closes the window displaying the taken pictures.

Map View

Opens and closes the window displaying the selected map.

Control Rack View

Opens and closes the window with the control rack.

Database View

Opens and closes the window with the current database view.

Project Tree

Turns ON and OFF the project tree window.

Add Database

Add a new database to an existing project.

Objects

Adds an object library to the project.

12 **Add Map to Project**

Selects a map or maps to be used in the current project from the map library.

13 **Project settings**

Opens the project settings window for the current project.

14 **Run**

Starts and stops the data collection process.

15 **Connect GPS**

Connect and disconnect to the GPS receiver.

General Settings
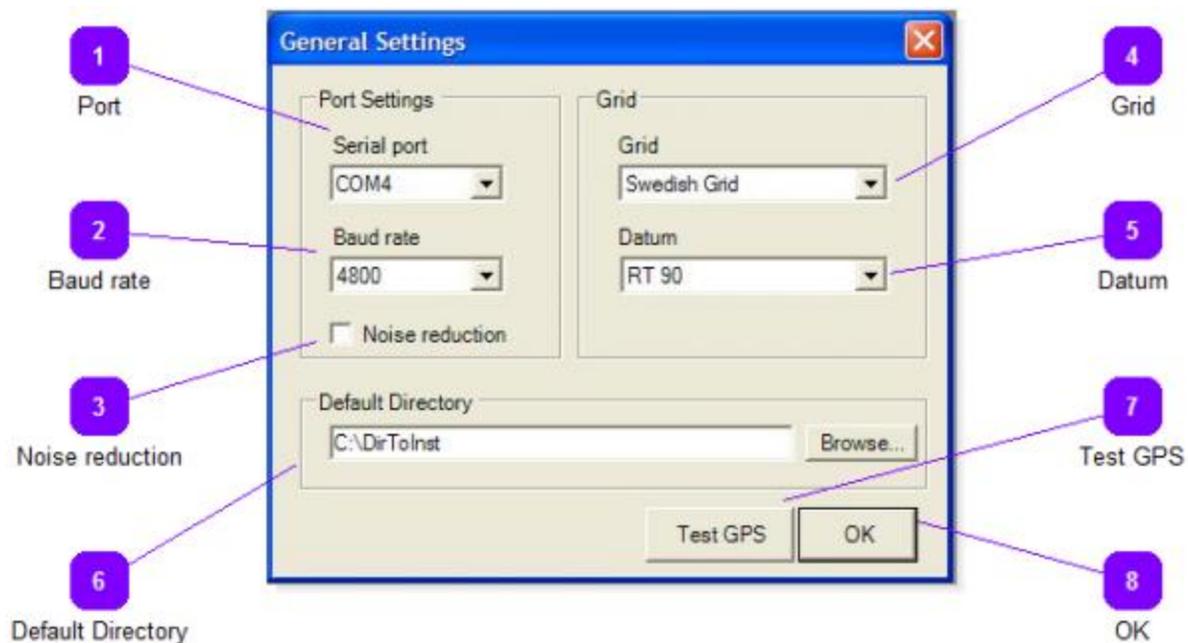
The general settings window contains the port, grid and default directory settings that will be used regularly by the application. It is possible to test from here that the GPS receiver is connected and properly functioning. It is important to notice that these values are saved and loaded every time the software starts up.

1 **Port**

Select the port to which the GPS receiver is connected.

2 **Baud rate**

Select from the drop-down menu the appropriated baud rate.

3 **Noise reduction**

☐ Noise reduction

The GPS coordinates will vary over a period of time, if the distance measurement is on then the traveled distance will increase even when standing still in one place. The noise reduction will ignore any changes which are less than 2 meters for the distance measurement. However this does not affect the collected values or the database, but only the traveled distance measurement.

4 **Grid**

Grid

Swedish Grid ▼

Select your national grid from the 43 available ones.

5 **Datum**

Datum

RT 90 ▼

Select the appropriated datum according to your location.

6 **Default Directory**

Default Directory

C:\DirToInst

Specify here the directory where you want all the projects or any specific project to be saved.

7 **Test GPS**

Test GPS

Press this button to check that the GPS unit is communicating correctly with the host computer.

8 **OK**

OK

Accept the changes and exit.

Projects Settings
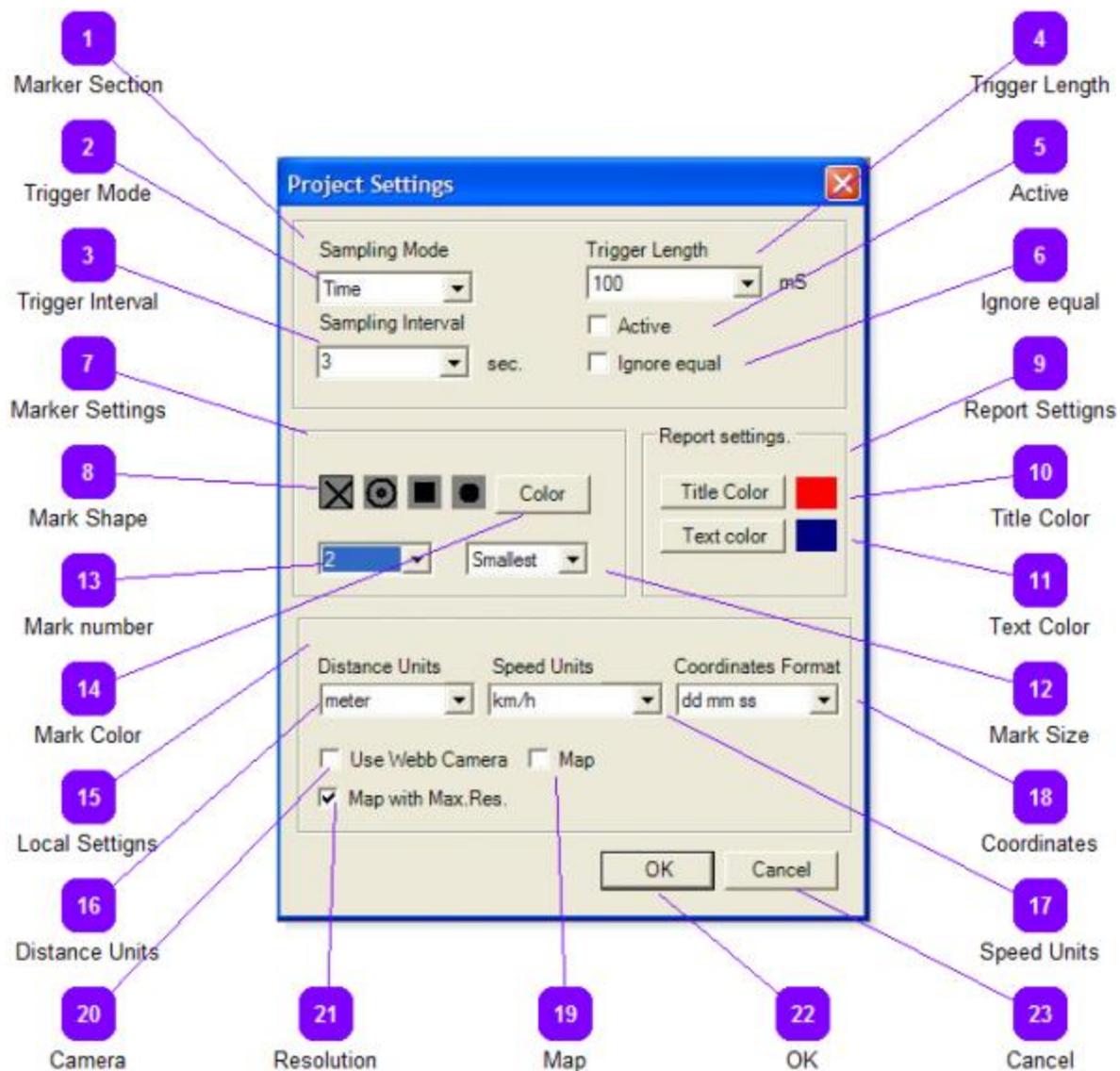
All the project specific settings can be changed here. The changes specified here are valid only for the current project otherwise the default values will be loaded.

1 **Marker Section**

In this box we set up all the relevant parameters for the external stimuli or marker.

2   **Trigger Mode**

Time ▼

Choose from the drop down menu the type of sampling mode from the two available: time or distance.

3   **Trigger Interval**

Sampling Interval

3 ▼ sec.
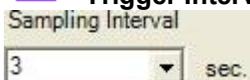
This is the interval between two triggers, it takes units according to the chosen trigger mode. That is, if the selected trigger mode is time then the units are in seconds and if the trigger mode is distance then the interval units are meters or feet.

4   **Trigger Length**

Trigger Length
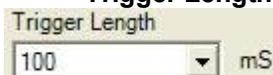
100 ▼ mS

Different units require triggers of different duration, this drop down menu allows to set up the duration of the trigger in milliseconds. The minimum length is 100 ms and the maximum length is 1000 ms.

5   **Active**
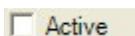
☐ Active

Select this check box to activate the trigger function in the unit.

6   **Ignore equal**

☐ Ignore equal
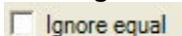
If the position of the GPS is the same as the previous marker position no marker output will be generated. This is useful to avoid double markers in the collecting device.

7   **Marker Settings**

⊠ ◉ ■ ● Color

2 ▼ Smallest ▼
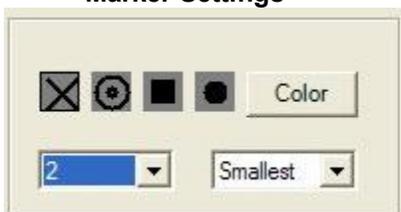
In this box we can set up the look and color of the marks that appear on the map.

8 **Mark Shape**

Select the shape of the marker on the map.

9 **Report Settigns**

Select the colors for the header and text in the HTML report.

10 **Title Color**

Selects the title color

11 **Text Color**

Selects the report text color.

12 **Mark Size**

There are four types of marker sizes available, select from the drop-down menu the one that suits you best.

13 **Mark number**

Select from the drop-down menu the thickness of the lines drawing the marker.

14 **Mark Color**

Color

Select the color for the marker.

15 **Local Settings**

Distance Units | Speed Units | Coordinates Format
meter ▼ | km/h ▼ | dd mm ss ▼

☐ Use Webb Camera ☐ Map
☑ Map with Max.Res.

Select the way the database, control rack and camera function.

16 **Distance Units**

Distance Units
meter ▼

Select from the drop-down menu the required system, metric or imperial.

17 **Speed Units**

Speed Units
km/h ▼

Select from the drop-down menu the speed units: km/h or miles/h

18 **Coordinates**

Coordinates Format
dd mm ss ▼

Chose the correct coordinates format: dd mm ss (degrees, minutes, seconds) or dd.dddd (degrees and decimals).

19 **Map**

☐ Map
Check this box if you want to use a map in the current project.

20   **Camera**

☐ Use Webb Camera

Check this box if you want to use the Webb Camera.

21   **Resolution**

☑ Map with Max.Res.

Check this box if you want GeoPointer X to select automatically from the available maps the one with the highest resolution for the current position.

22   **OK**

OK

Apply the changes and exit.

23   **Cancel**

Cancel

Exit without applying any changes.

Project Tree View
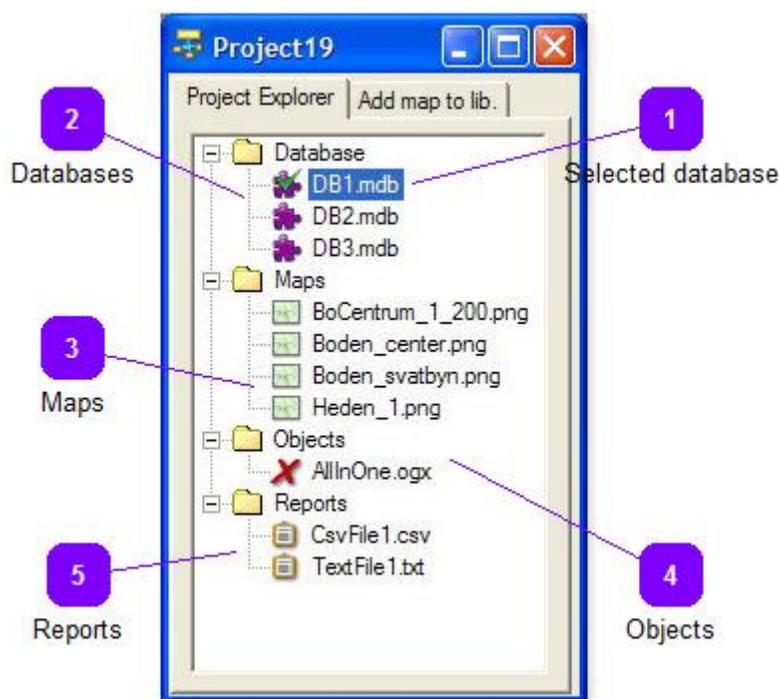
Select here the active database and the loaded maps. Here it is also possible to select report and open them.

Selected database

This is the selected database. All the data collected, photos, markers etc will be stored on the selected database. In viewing mode this is the database shown in the database window.
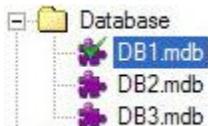
Databases

These are all the available databases within this project. In the project tree it is possible to select, rename and delete from project any of the available databases. However, in order to add a new database to the project it is necessary to press the add database button in the main toolbar.

3 **Maps**

- Maps
  - BoCentrum_1_200.png
  - Boden_center.png
  - Boden_svatbyn.png
  - Heden_1.png
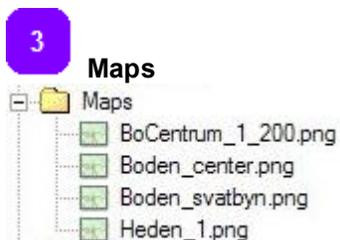
These are all the available maps within this project. Right click on any map to remove it from the project or to select it as the one displayed in the map view window. In order to add a map to the project follow the instructions in the <Add Map to Project> section. There is no need to have any map active for a project to collect or view the data, maps can be freely added later on.

4 **Objects**

- Objects
  - AllInOne.ogx

Contains all the available object libraries for the current project. Object libraries can be downloaded from Geoscanners AB web site in the downloads section.

5 **Reports**

- Reports
  - CsvFile1.csv
  - TextFile1.txt
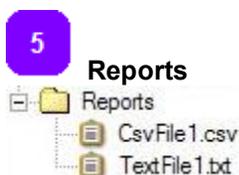
This folder contains all the reports generated by the software within this particular project. It is possible to double click on any report in order to open it.

Database View
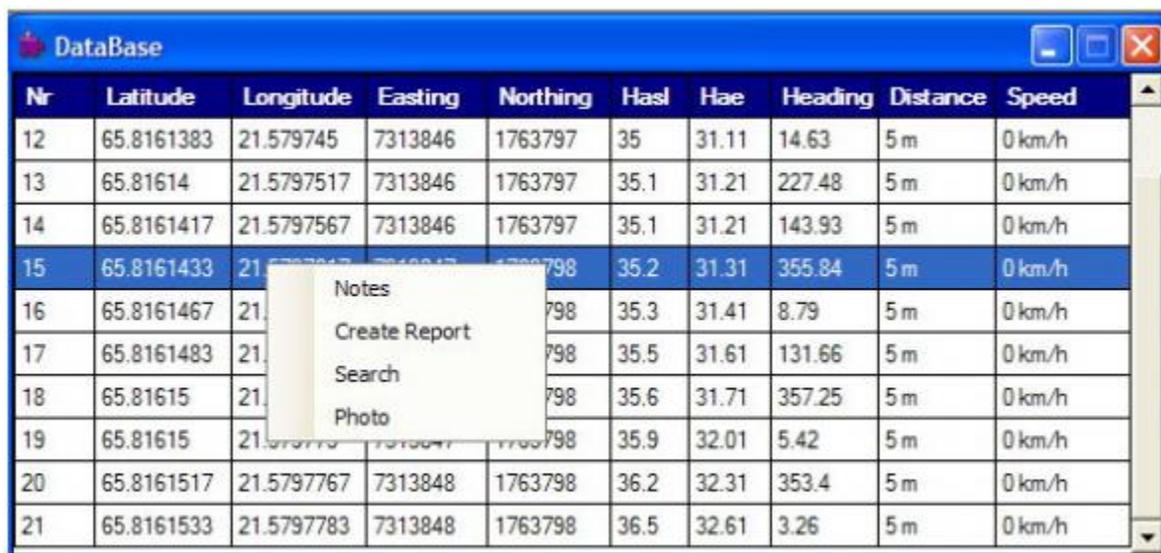
Nr	Latitude	Longitude	Easting	Northing	Hasl	Hae	Heading	Distance	Speed
12	65.8161383	21.579745	7313846	1763797	35	31.11	14.63	5 m	0 km/h
13	65.81614	21.5797517	7313846	1763797	35.1	31.21	227.48	5 m	0 km/h
14	65.8161417	21.5797567	7313846	1763797	35.1	31.21	143.93	5 m	0 km/h
15	65.8161433	21.5797617	7313847	1763798	35.2	31.31	355.84	5 m	0 km/h
16	65.8161467	21.		798	35.3	31.41	8.79	5 m	0 km/h
17	65.8161483	21.		798	35.5	31.61	131.66	5 m	0 km/h
18	65.81615	21.		798	35.6	31.71	357.25	5 m	0 km/h
19	65.81615	21.5797775	7313847	1763798	35.9	32.01	5.42	5 m	0 km/h
20	65.8161517	21.5797767	7313848	1763798	36.2	32.31	353.4	5 m	0 km/h
21	65.8161533	21.5797783	7313848	1763798	36.5	32.61	3.26	5 m	0 km/h

Context menu:
- Notes
- Create Report
- Search
- Photo

A new database is created together with every newly created project. It is possible to add more databases to any given project, this can be done by pressing the <Add database> button. The data is saved in the selected database according to the settings specified in the project settings section. Each database contains all the information coming from the GPS receiver, camera, object information and notes added at a later time. It is possible to search the database and to use it for creating html reports.

The projects databases can be renamed or deleted from the project, this is done from the tree view window.

In order to add notes, create reports, search the database or display the photo for the selected position, press the right button of your mouse and select the required operation from the context menu.

Map View

The current position is shown on the map while collecting the data; in viewing mode all collected positions are displayed showing the traveled route during collection. The shape, size and color of the markers on the map is configurable from the <project settings> menu.

1 **Map**

A picture of the selected map is displayed in the map view together with the markers corresponding to the records in the selected database.

2 **Markers**
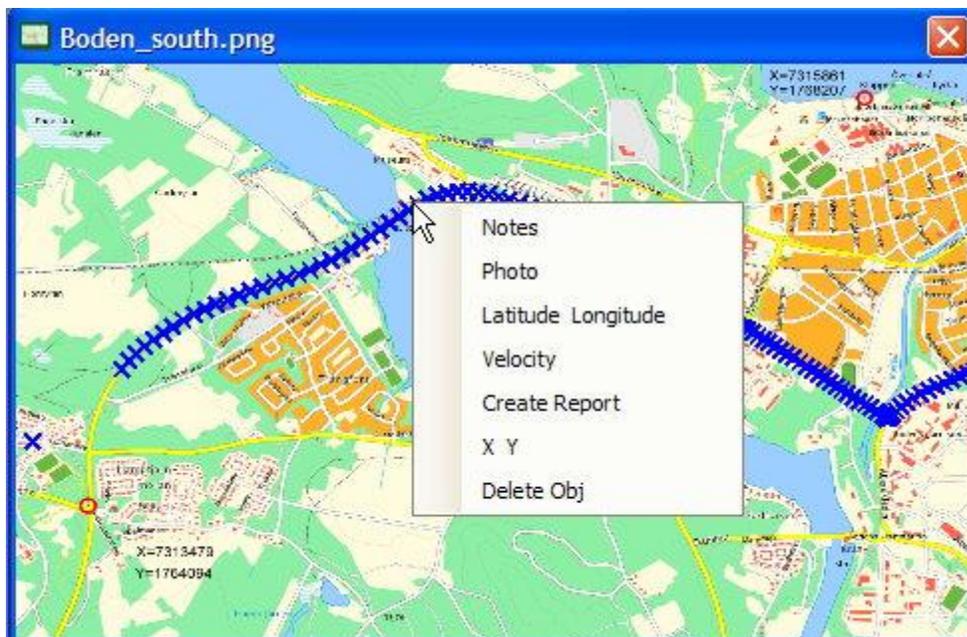
Each marker represents a record in the database, all the information of that record is available via the the map view. In order to get any of the values for a particular record, press the right button on your mouse and select from the context menu the desired item.

If the database view is open while selecting a marker on the map view, then the database will scroll automatically to show the selected record with all the available values.

The map view and the database view are dynamically linked making possible to add notes or change existing ones from the map view.

Instrument rack
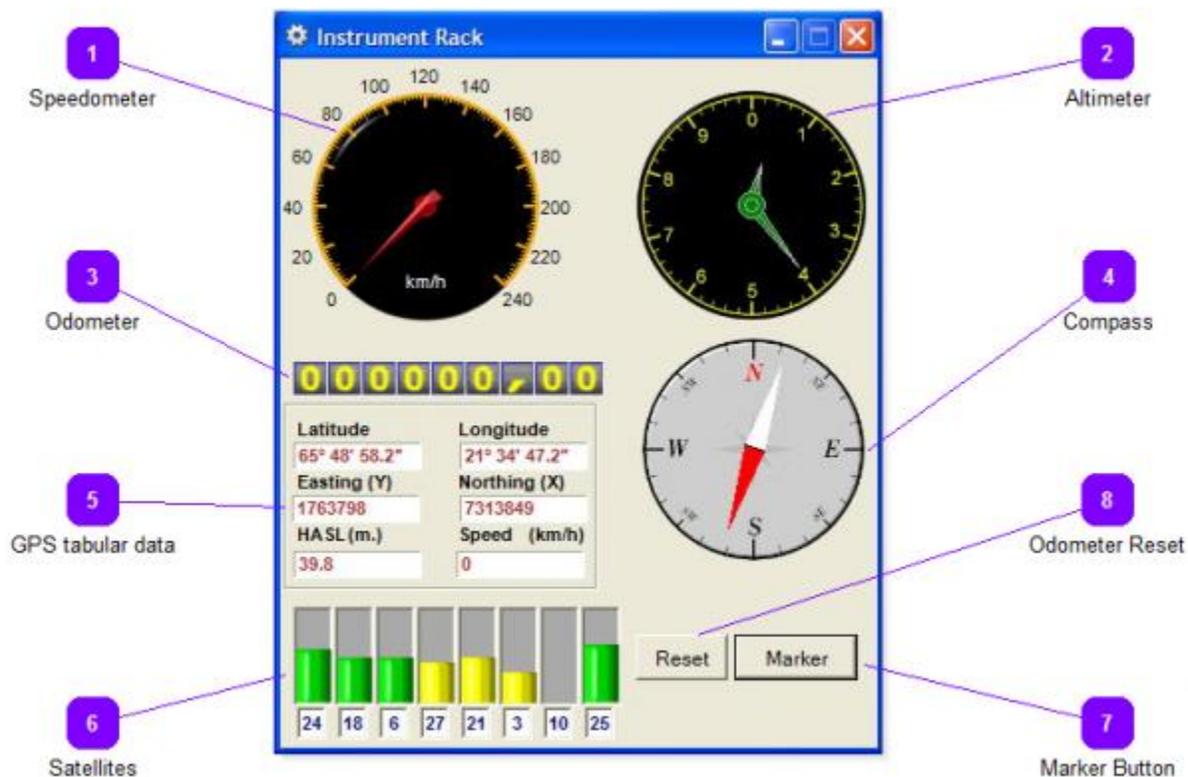
This is a virtual instrument panel with several instruments showing readings from the GPS in an analogue form. From this panel is possible to send triggers using the marker button and monitor the amount of available satellites and the quality of the reception.

1 **Speedometer**

The speedometer shows the current speed of the vehicle where the GPS receiver is attached.

2 **Altimeter**

This instrument presents the height above mean sea level in an analogue form, the same way altimeters in aircrafts.

3   **Odometer**

The odometer shows the trip distance in the units selected in the project settings. This trip distance can be reset by the proper button.

4   **Compass**

This instrument presents the direction of the movement. Please note that this instrument doesn't show any meaningful data unless the vehicle where the GPS receiver is located is moving.

5   **GPS tabular data**

This box shows the latitude, longitude as well as the easting and northing of the current position. It also shows the readings of the speedometer and the altimeter in a numerical format.

6   **Satellites**

This bar graph present the available satellites by number together with the strength of the signal reception. While the bar is green the reception is OK, orange and further more red bar are signs of poor reception.

7   **Marker Button**

This button forces a trigger pulse with the parameters set in the project options to the output triggering device.

8   **Odometer Reset**

This button resets the trip distance value in the odometer display.

Photo View
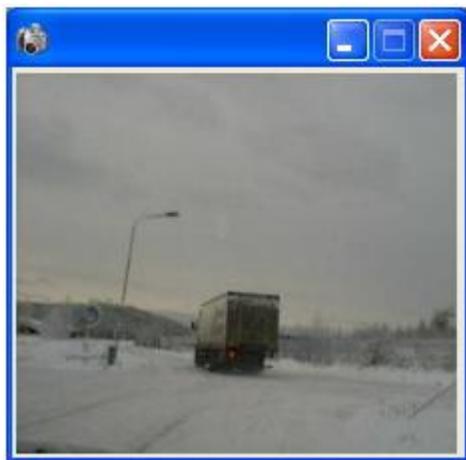
Every record can have a picture as one of the values in the database. If a camera is connected to the host computer and it has been selected to be active in the <project settings>, then with every stored position a picture will follow.
The picture in the photo view window can be stored as an image file of the type BMP or JPEG or alternatively sent to the printer. While the photo view is active select from the main menu <file> <save photo> the windows explorer opens asking for the location and the type of image file to store the picture.
We recommend to set the time interval between two consecutive pictures to be no less than 3 seconds.

Search Database
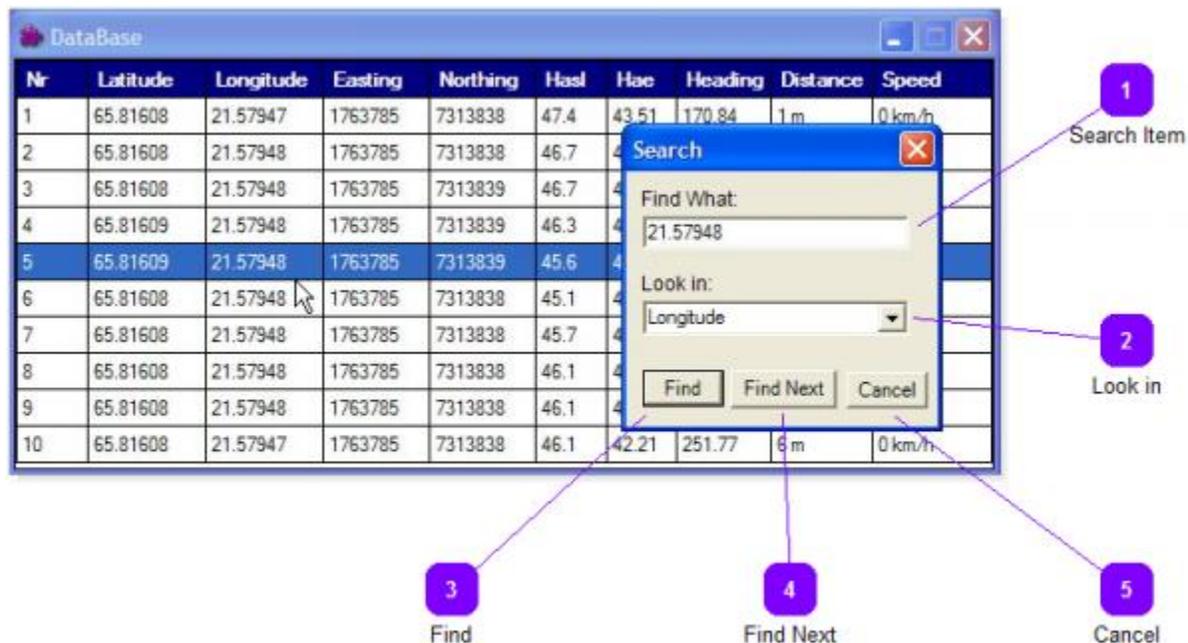
With this function it is possible to search in the entire database for some specific value.

1 **Search Item**

Find What:

21.57948

Enter in this field the specific record you want to find in the specified column of the database.

2 **Look in**

Look in:

Longitude
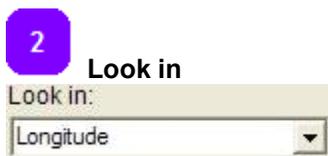
Specify the column to perform the search, it is not possible to search multiple columns at the same time.

3 **Find**
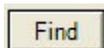
Find

Press this button to search the database.

4 **Find Next**

Find Next

Repeat the search.

5 **Cancel**

Cancel

Close the search window.

Add Map to Library
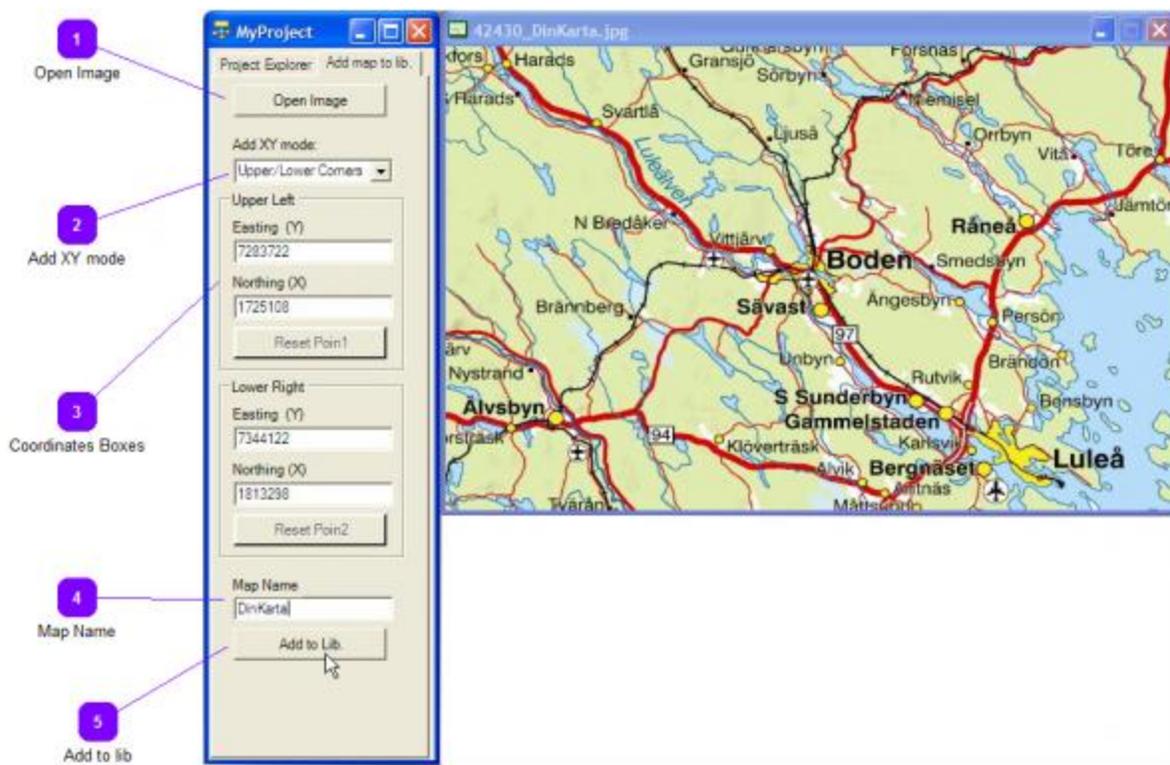
GeoPointer X ® uses a common map library for all the projects. Before any map can be used by a project it most be added to this map library. To add a map to the map library select from the main menu <tools> and from it <add map to map library>. The same can be achieved using the icon <add map to map library> in the main toolbar. The project tree window opens on its <add map to lib> tab. A third way of adding a map to the map library is to select the tab <add map to lib> in the project tree window if the later was open.
In the <add map to lib> tab press the <Open Image> button and select from the windows explorer the map image to be added to the map library. GeoPointer X ® currently supports five image formats, bmp, tif, gif, png and jpg.
When the image is loaded into the map window select the XY mode. There are three different ways for specifying the way the coordinates will be added to the map:
-Two points: the user selects two points in the loaded map image and enters the corresponding coordinates in the boxes <control point 1> and <control point 2> boxes. It is possible to reset the selected points by pressing the corresponding "reset point #" button.
-Upper/Lower corners: the user enters the coordinates for the upper left and lower right corners.
-Geotiff: the coordinates are read from a geotif compatible file.

After selecting the coordinates points it is necessary to give a name for the map. Press the button <add to lib> in order to get the newly created GeoPointer X ® map to the library.

1   **Open Image**
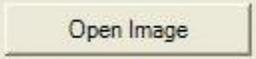
Open Image

Loads an image file into the map window for adding coordinates information to it.

2   **Add XY mode**
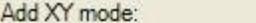
Add XY mode:

Upper/Lower Corners ▼

Select the way the coordinates will be entered to the image file in order to create the map. There are three options available from the drop down menu: two points, upper/lower corners and geotiff.

3   **Coordinates Boxes**

Upper Left

Easting (Y)

7283722

Northing (X)

1725108

Reset Poin1

Enter in these boxes the required coordinates depending on the selected XY mode.

4   **Map Name**

Map Name

DinKarta

Enter in this field the name for the newly created map.

5   **Add to lib**
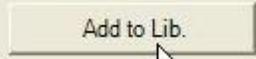
Add to Lib.

Accept all the settings and add the map to the application map library.

Copyright© 2008 Geoscanners AB
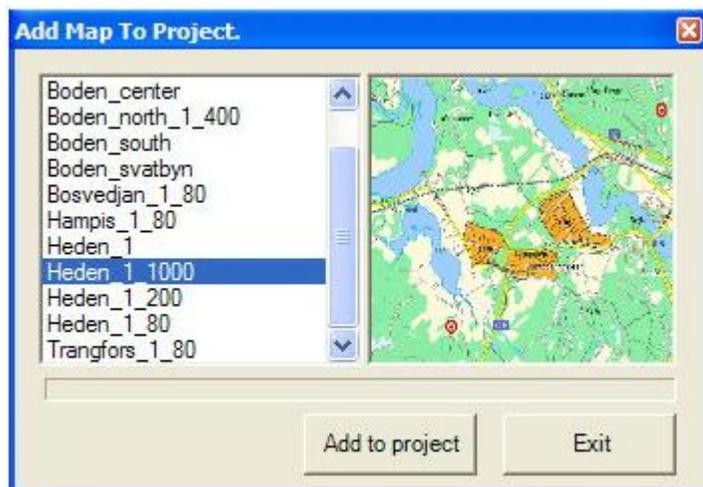
Add Map to Project

There are two ways of adding maps to a project from the application's map library. The first way is to select the map folder in the project tree window and press the right button of the mouse from the context menu select õadd mapö. The second way is to select from the main toolbar the õadd map to projectö button, alternatively Ctrl+Alt+M. In both cases a new window opens where you can select the needed map from all the existing maps in the application's map library, press the <Add to project> button to complete the action. More than one map can be loaded at once, when all the required maps have been loaded close the window by pressing <Exit>.

Report Creation
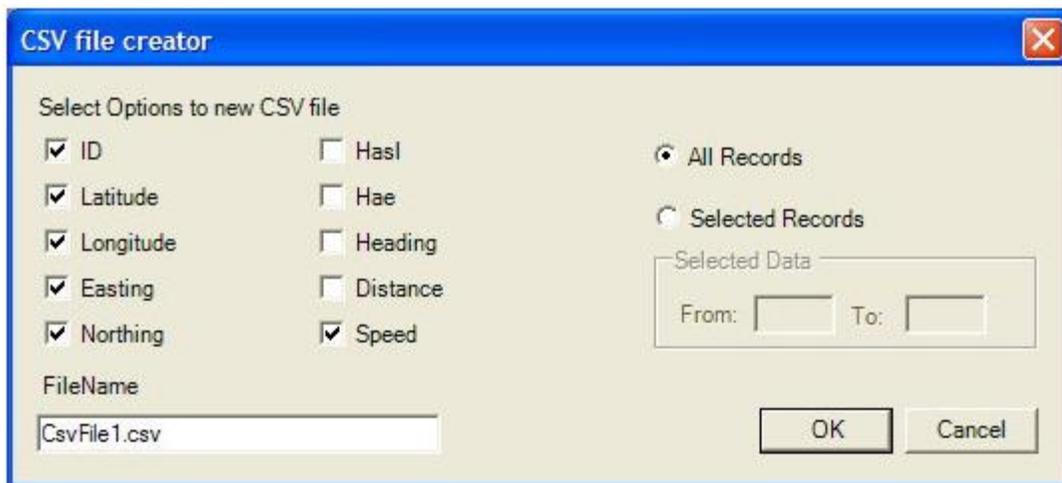
GeoPointer X® allows for the creation of HTML, ASCII and CSV reports. For the HTML report all the available values for the selected record are selected including the photo if there is one. On the other hand for the ASCII and CSV reports the available values of the selected/all records can be selected or alternatively only the ones of interest; no photo will be added though.
All reports, upon creation, are stored in the default directory of the project and will be automatically listed in the project tree view if it is open.

Object
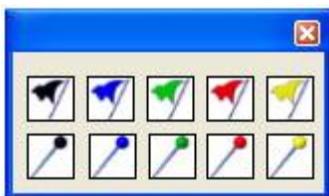
The objects are store in libraries with the extension OGX. New libraries are added to the project via the <objects> icon in the main toolbar.Right click to select from the project tree the required library or to remove it from the current project.

Each library contains no more than ten objects. The objects are available during collection of the data and are called using the number keys on your keyboard. It is important to notice that the numeric keypad won't work!.

All the objects are numbered in the library from 0 to 9 and top to bottom and from left to right, for instance in the displayed library the black flag has number zero and the blue pin number six. To set an object on the map the map view must be active, press the corresponding number on your keyboard to display the object on the map and to store its position on the database.